Imipenem-EDTA Disk Methods for Detecting Metallo-β-Lactamase-Producing Pseudomonas aeruginosa in Arak

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Background & Objectives: *Pseudomonas aeruginosa* is a life-threatening agent for immuno-compromised patients. This gram negative bacterium is resistant to the various antibiotics. Until now several resistance mechanisms in P. aeruginosa have been known, Metallo-β-lactamase (MBL) production is one of the significant mechanisms in antibiotic resistance. We aimed to determine frequency of MBL-producing *P. aeruginosa* in Arak.

Methods: In this study 108 strains were obtained from different clinical samples of hospitalized patients in Arak hospitals. After identifing P. aeruginosa strains by microbiological tests, antibiotic susceptibility test was done for imipenem by disk diffiusion Methods according to NCCLS (National Committee for Clinical Laboratory Standards). Imipenem-EDTA was performed for imipenem-resistant strains. A 0.5 M EDTA solution was prepared by dissolving 186.1 g of disodium EDTA .2H2O in 1000 ml of distilled water and adjusting it to pH 8.0 by using NaOH. The mixture was sterilized, then imipenem disk contained EDTA was dried in an incubator. Two 10 mg imipenem disks were placed on the surface of an agar plate and EDTA solution was added to one of them to obtain concentration of 930 µg. The inhibition zones of imipenem and imipenem-EDTA disks were compared after 16-18 h of incubation at 35oC. Enhancement in inhibition zone (≥7 mm) for imipenem-EDTA disk is referred to MBL positive (4, 5).

Results: Among 108 P. aeruginosa isolates 40 strains were resistant to imipenem. 20 out of 40 imipenem-resistant strains showed MBL positive.

Conclusion: Results illustrated half of imipenem-resistant strains were MBL positive. Therefore it is important to detect MBL-producing strains due to control their transmission. In addition phenotypic detection of MBLs is not an accurate Methods, molecular studies could reveal more accurate data.

Keywords: EDTA; Imipenem; Metallo Beta Lactamase; *Pseudomonas aeruginosa*